UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

Faculty of Geoengineering

Course title: AIR PROTECTION

ECTS credit allocation (and other scores): 3.0

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 30/15

Course coordinator/ Department and e-mail: prof. dr hab inż. Marcin Dębowski/Department of Environmental Engineering; marcin.debowski@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Calculations using the laws of ideal gas. Calculation of emission standards from installations. Calculation of gas properties including density, relative humidity, absolute humidity, degree of wetting, diffusion coefficients, viscosity coefficients. Converting exhaust gas concentrations in the form of mole fraction, volume percentage, mass concentration, molar concentration, ppm concentration, partial pressure. Calculation of emissions based on factors, from measurements and from a mass balance. Calculation of the amount and composition of exhaust gases during combustion of gaseous fuels with different characteristics, coal, and liquid fuels.

LECTURES: Basic concepts of air protection and air pollution. The composition of the atmospheric air. Gas and dust pollutants in the air. Sources of air pollution - natural and anthropogenic (point, line, and surface). Determination and determination of concentrations of gaseous pollutants and dust fall in the context of permissible levels. Legal regulations concerning air protection - permissible levels of air pollutants. Methods, technologies, and devices for stopping dust and gaseous pollutants generated in emission sources - gas dedusting, removal of gas components. Technologies for reducing emissions of sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds, polycyclic aromatic hydrocarbons, furans, dioxins.

Learning purpose: Transfer, arrangement and development of general knowledge covering key issues in the field of air protection.

On completion of the study programme the graduate will gain:

Knowledge: Has ordered, theoretically founded general knowledge covering key issues in the field of air protection.

Skills: Can use computational methods to formulate and solve engineering tasks in the field of air protection. Is able to identify and formulate the specification of simple engineering tasks of a practical nature, characteristic for the studied field of study.

Social Competencies: Correctly identifies and resolves dilemmas related to the profession in terms of issues related to the broadly understood air protection.

Basic literature:

1) Gubrynowicz A., "Ochrona powietrza w świetle prawa międzynarodowego", wyd. wyd. Liber, 2005; 2) Szklarczyk M, "Ochrona atmosfery", wyd. UWM, 2001; 3) Warych J., "Oczyszczanie gazów - procesy i aparatura", wyd. WNT, 1998; 4) Warych J. "Proces oczyszczania gazów. Problemy projektowo – obliczeniowe.", wyd. Politechniki Wrocławskiej, 1999

Supplementary literature: ---

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 1.88

Student's independent work: 1.62